THE SIR-C/X-SAR MISSION

JoBea Way, Diane Evans and Charles Elachi

Jet Propulsion Laboratory, California Institute of Technology

The Shuttle Imaging Radar-C and X-Band Synthetic Aperture Radar (SIR-C/X-SAR) is a cooperative experiment between the National Aeronautics and Space Administration (NASA), the German Space Agency (DARA), and the Italian Space Agency (ASI). The experiment is the next evolutionary step in NASA's Spaceborne Imaging Radar (SIR) program that began with the Seasat SAR in 1978, and continued with SIR-A in 1981 and SIR-B in 1984. The program will eventually lead to the Earth Observing System (EOS) SAR later in this decade.

SIR-C will provide increased capability over Seasat, SIR-A, and SIR-B by acquiring polarimetric images simultaneously at two microwave frequencies: L-band (λ = 24 cm) and C-band (λ = 6 cm). X-SAR will operate at X-band (λ = 3 cm) with VV polarization, resulting in a three-frequency capability. Because radar backscatter is most strongly influenced by objects comparable in size to the radar wavelength, this multifrequency capability will provide information about the Earth's surface over a wide range of scales not discernable with previous single-frequency experiments. The polarimetric data will yield quantitative information about the surface geometric structure, vegetation dielectric properties, and subsurface discontinuities.

The first SIR-C/X-SAR flight is planned for early in 1994, with two subsequent flights in different seasons to enable data acquisition under different environmental conditions. SIR-C/X-SAR will collect data for a period of 6 to 9 days during each flight. The instrument will be flown in a 57° inclination orbit with a nominal orbital altitude of 215 km. This altitude will result in a slightly drifting orbit.

The latest status of the SIR-C/X-SAR mission and instrument design, science activities and expected results will be presented.

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